

REMARKS

Claims 1-10 were examined in the Office Action. Claims 1-5 are allowed. Claims 6-10 are rejected. Claims 1-24 remain.

Applicant requests reconsideration of the application in view of the following remarks.

I. 35 U.S.C. § 102(e)

It is asserted in the Office Action that claims 6, 7, 9 and 10 are rejected under 35 U.S.C. § 102(e), as being anticipated by U. S. Publication 2003/0171134 to Doi ("Doi"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2131,

'[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' (*Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). 'The identical invention must be shown in as complete detail as is contained in the ... claim.' (*Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, *i.e.*, identity of terminology is not required. (*In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)).

Applicant's amended claim 6 contains the limitations of

[a]n adaptive antenna control method used for a radio communication system, the radio communication system comprising a plurality of radio base stations and a plurality of terminal stations capable of communicating with the radio base stations, each radio base station including an adaptive antenna having a plurality of antenna elements, weighting circuits for respectively weighting reception signals of the plurality of antenna elements, and a signal combining circuit for combining the reception signals of the antenna elements weighted by the weighting circuits, the method comprising: for reception by each radio base station, estimating an interference wave power given by a transmission signal from each of the plurality of terminal

stations, estimating a sum of the interference wave power, and simultaneously determining a weight vector in the adaptive antenna of each radio base station and a transmission power of each terminal station to minimize a sum of square errors between reception signals and desired signals for all the terminal stations which simultaneously use the same communication channel by minimizing the sum of the interference wave power obtained.

In Applicant's amended claim 6, the *weight vector* at an adaptive antenna device is determined *simultaneously with the transmission power* at a terminal station. It is asserted in the Office Action that the transmission power of each terminal station determined in Applicant's claimed invention is equivalent to the reception signal $x1(t)$ - $x4(t)$ at each base station in Doi (Office Action, page 3, line 6). However, $x1(t)$ - $x4(t)$ represents reception signals, respectively, received by four antenna elements of the base station. The signals $x1(t)$ - $x4(t)$ includes not only a transmission signal $D(t)$ as a desired wave from a certain terminal station, but also transmission signals $U(t)$ - $T2$ as interference waves from other terminal stations and other noises $n1(t)$ - $n4(t)$. Therefore, it will be obvious that the transmission power of the terminal station in Applicant's claimed invention is not equivalent to the reception signal $x1(t)$ - $x4(t)$.

Certainly, it could be said that the reception signal $x1(t)$ - $x4(t)$ contains the transmission power of the terminal station. Doi only teaches that the power of signals transmitted in the past from the terminal station is detected at the base station. To the contrary, Applicant's claimed invention asserts that the power of signals to be transmitted in the future from the terminal station is determined, which is distinctly different from Doi.

Thus, the transmission power of the terminal station is not determined at the base station in Doi. In other words, Doi discloses nothing more than a technique for optimizing the weighting in an adaptive antenna device with a predetermined transmission power of the terminal station in accordance with the method described in sections [0163] through [0166]. Namely, the transmission power of the terminal station and the weighting of the adaptive antenna device are determined *separately* from each other. Therefore, Doi differs distinctly from Applicant's claimed invention, which determines the transmission power of the terminal station and the weighting of the adaptive antenna device *simultaneously*. It goes without saying that any combination of a technique for determining the transmission power of the terminal station with

the teaching of Doi will not yield such a concept as taught by Applicant's claimed invention, so long as in Doi the transmission power is determined separately from the weighting.

Further, Applicant's claimed invention is based on a unique principle for determining a weight vector at an adaptive antenna device and the transmission power of a terminal station. Specifically, according to Applicant's claimed invention, in an entire system comprising a plurality of base stations and a plurality of terminal stations, the weight vector of an adaptive antenna device at each base station and the transmission power of each terminal station are determined so as to minimize a sum of square errors between reception signals and desired signals for all base stations. Hence, according to Applicant's claimed invention, it is possible to prevent the transmission quality from locally deteriorating within the system and thereby to ensure good transmission quality over the entire system.

On the contrary, although a plurality of base stations are shown in Doi, such base stations are not linked up with each other. Consequently, the control function at each base station allows for transmission quality of only itself without considering, any extensively, influences it will give on other base stations.

For example, if the reception power of the base station is decreased in a transmission power control system of the prior art that controls the power so that the base station receives a constant power, it works to increase the transmission power of the terminal station. Therefore, since the increase in the transmission power is determined without taking account of interference possibly given to other base stations, such base stations may sometimes undergo deterioration in transmission quality.

Further, similar problems will occur even if a transmission power control system of the prior art that works so as to attain a predetermined target signal-to-interference power ratio (SIR) is used. Although such a system functions to increase the transmission power of the terminal station when the reception power is decreased at the base station, the transmission quality may sometimes deteriorate at other base stations, because interference to such other base stations is also not accounted for.

Thus, with the transmission power control system of the prior art, it is neither possible to effectively minimize the sum of square errors over the entire system nor to realize a good transmission quality for the entire system.

Therefore, since Doi does not disclose, teach or suggest all of Applicant's amended claim 6 limitations, Applicant respectfully asserts that a *prima facie* rejection under 35 U.S.C. § 102(e) has not been adequately set forth relative to Doi. Thus, Applicant's amended claim 6 is not anticipated by Doi. Additionally, the claims that directly or indirectly depend on claim 6, namely claims 7, 9 and 10, are also not anticipated by Doi for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 102(e) rejections for claims 6, 7, 9 and 10 are respectfully requested.

II. 35 U.S.C. § 103(a)

It is asserted in the Office Action that claim 8 is rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Doi and in further view of JP 2001-285163 issued to Kasami ("Kasami"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2142

[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. (*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

Further, according to MPEP §2143.03, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974))." "*All words in a claim must be considered in*

judging the patentability of that claim against the prior art.” (In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), emphasis added.)

Applicant’s claim 8 indirectly depends on amended claim 6. Applicant has addressed Doi regarding amended claim 6 above in section I.

Kasami discloses a mobile communication system where base stations include an array antenna and a control station that controls the base stations. Kasami, however, does not teach, disclose or suggest Applicant’s amended claim 6 limitations of

simultaneously determining a weight vector in the adaptive antenna of each radio base station and a transmission power of each terminal station to minimize a sum of square errors between reception signals and desired signals for all the terminal stations which simultaneously use the same communication channel by minimizing the sum of the interference wave power obtained.

Therefore, even if Doi were combined with Kasami, the resulting invention would still not teach, disclose or suggest all of Applicant’s amended claim 6 limitations as listed above. Since neither Doi, Kasami, and therefore, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant’s amended claim 6, as listed above, Applicant’s amended claim 6 is not obvious over Doi in view of Kasami since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claim that indirectly depends from amended claim 6, namely claim 8, would also not be obvious over Doi in view of Kasami for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection for claim 8 is respectfully requested.

III. Allowable Subject Matter

Applicant notes with appreciation the Examiner's assertion that claims 1-5 are allowed.

Applicant respectfully asserts that claims 1-24, as they now stand, are allowable for the reasons given above.

CONCLUSION

In view of the foregoing, it is submitted that claims 1-24 patentably define the subject invention over the cited references of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being submitted electronically via EFS Web on the date shown below to the United States Patent and Trademark Office.


Jean Svoboda

Date: April 9, 2007